UNITED STATES ARMY

AVIATION DIGEST

MARCH 1984

PRE-POSITIONING

Is it feasible?

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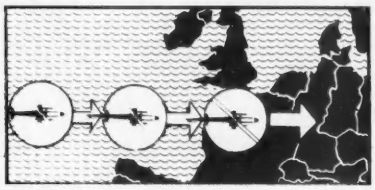

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Richard K. Tierney
Editor

Honorable John O. Marsh Jr.
Secretary of the Army

The mission of the *U.S. Army Aviation Digest* (USPS 415-350) is to provide information of an operational, functional nature concerning safety and aircraft accident prevention, training, maintenance, operations, research and development, aviation medicine and other related data.

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WE ALL EXTEND a hearty welcome to BG Wayne C. Knudson as the new Army Aviation Officer at ODCSOPS. BG Knudson brings to the Army Staff a broad and extensive background in Aviation at all levels of command and staff. MG Molinelli has been reassigned to U.S. Army Readiness and Mobilization Region I, Ft. Devens, MA. We thank him for his great work and wish him well in his new responsibilities and job.

The March issue starts off with an article on the "Pre-Positioning of Army Aircraft." This concept has undergone validation testing for 18 months and will greatly enhance the rapid strategic and tactical reinforcement of NATO. MAJ Dandridge reports the long-term storage procedure for FMC helicopters has resulted in no significant deterioration up to 14 months during this test, with an extension probability of up to 4 years. Preparation for storage per aircraft takes 6 hours, with only 30 minutes required to depreserve and arm for combat.

One of the Aviation Center's new responsibilities as proponent of the Aviation Branch is the full professional development of Aviation commissioned and warrant officers in the tactical, technical and managerial skills they will need to successfully command, manage, lead, train and employ Aviation units. CPT (P) Henry's article, "Training the Aviation Warrant and Commissioned Officers," describes the commissioned officer training from the Aviation Officer Basic Course through Senior Service School eligibility together with the warrant officer's training from the Warrant Officer Candidate Course through the Warrant Officer Senior Course.

The Army Safety Center brings another fine article in "The Human Factor in Aviation Mishaps." The variables in behavior and reaction to stress are countless and complicated; to learn from the mistakes of others without experiencing the events is extremely difficult. Though pilot error is often cited as the major cause factor of aircraft accidents, often a chain of human errors began long before the aircraft left the ground on its ultimate plight. All are subject to internal and external stress. Your awareness and recognition of these facts are positive steps in accident prevention—you *are* the human factor.

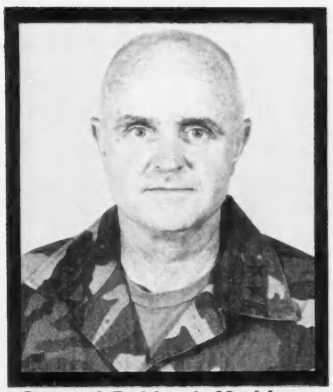
In an era of sophisticated avionics and aircraft, simple facts such as "Wind Sense" are sometimes overlooked or ignored. The Directorate of Evaluation and Standardization suggests using common sense and going back to the basics of determining wind direction and velocity. This practice can further an aviator's professionalism and serves as another tool in accident prevention.

The more significant issues, recommendations and decisions made at the "1983 Army Aviation Policy Committee Meeting" are highlighted in the article by MAJ Bryan Fluke and Mr. James Wall. The trend of these decisions will be felt for many years by Army aviators. Read this article to stay abreast of new policy that is being implemented.

CPT (P) James Herberg tells us, "You Can Trust the Russians." The threat article gives examples of Soviet actions, though fictional, that are based on events that actually occurred. As he vividly indicates, "...it is not in words that we see the Soviet nature, but rather in their actions."

"Training the Army Aviator—Why Can't It Be Fun?" by CPT (P) John Morrisette offers a way of expanding the teaching of general and technical facts needed by aviators that is enjoyable, yet productive. The game can be tailored to the unit's aircraft and mission; be for teams or individuals; and, be easy or hard, friendly or competitive. As the author suggests, you're bound to benefit.

As we continue our maturity as an Aviation Branch, the articles of this publication will be a cohesive informational force. I encourage your input and expression via the forum of the *Aviation Digest.*



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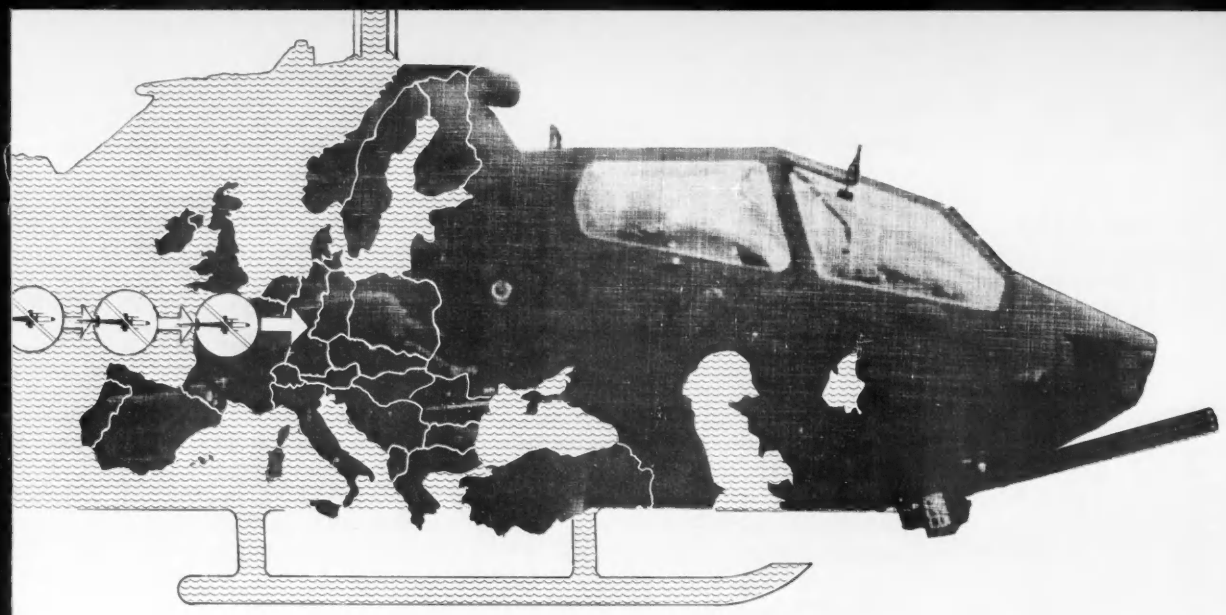


Strategic and Tactical

PRE-POSITIONING of Army Aircraft

Pre-positioning of helicopters is the only cost effective and immediately available way to rapidly reinforce NATO with Army Aviation units.

Major Wayne L. Dandridge

This article represents the views of the author and does not necessarily reflect the official opinion of the Department of Defense or any of its agencies.

THE U.S. Army recently completed a unique 18-month science project in the Federal Republic of Germany which resulted in the development of an exciting new long-term aircraft storage technique. This important study has proven that the most complex helicopters may be stored fully fueled, under minimum preservation (about six man-hours) and in a controlled-humidity environment for up to 14 months and probably much longer (estimated to be up to 4 years) without any significant deterioration. Aircraft will remain fully mission capable (FMC) under the new storage technique and may be used for combat operations after 30 minutes' depreservation and arming.

A detailed description of this new storage procedure is being incorporated as a new section in the Storage and Maintenance of Prepositioned Materiel Configured to Unit Sets (POMCUS) Technical Manual (TM) 38-450. Changes incorporating the new storage procedure also have been proposed for the AH-1 Cobra helicopter, UH-1 Huey helicopter and the

OH-58 Kiowa helicopter unit and intermediate maintenance manuals' storage section (Appendix E of each -23 manual). Other changes, adopting the new aircraft battery trickle charge procedures developed during the project, have been recommended for the Army nickel-cadmium battery maintenance manuals, TM 11-6140-203-14-1 and -2.

Accordingly, this new storage technique is available for use by the Army for the "strategic" pre-positioning of combat-ready helicopters belonging to deployable units. Strategic pre-positioning is the only immediately available and cost-effective way to reduce early U.S. Air Force airlift of Army aircraft needed to rapidly reinforce the North Atlantic Treaty Organization (NATO). The new storage procedure is also suitable for "tactical pre-positioning," whereby in-theater helicopters may be maintained FMC with little maintenance, supply, fuel and crew support during long periods of time. This tactical application could increase unit readiness; would provide for the rotation of aircraft through a thorough maintenance program; and could reduce mismatches in the number of helicopters, flying hours, fuel and crew personnel available in the U.S. Army.

This new long-term storage technique is the result of the "Joint U.S. Army Troop Support and Aviation Materiel Readiness Command (USATSARCOM)/U.S. Army Europe (USAREUR) Concept Validation Program for Placing Aircraft in Pre-positioned Storage" that was conducted in the Federal Republic of Germany from January 1982 through September 1983. (NOTE: Since this article was written the U.S. Army Troop Support and Aviation Materiel Readiness Command, USATSARCOM, has been changed to the U.S. Army Troop Support Command, TROSCOM.) The Department of the Army's Office of the Deputy Chief of Staff for Logistics sponsored the validation project. The Cobra Project Manager, TSARCOM, was the executive agent for this storage program, and the chief, War Reserves/Storage Division, Office of the Deputy Chief of Staff for Logistics, USAREUR, represented the U.S. Army Europe as an equal partner in the validation project.

Background

The U.S. Army has known for many years that the rapid reinforcement of NATO with Army aircraft posed a particularly difficult strategic task for planners. Military leaders also have recognized the need for a tactically cost-effective way to store aircraft in a ready-to-fight condition for use when a unit does not have the assets (maintenance, personnel, fuel) to fly the aircraft regularly. For these two reasons, TSARCOM began the Aviation Materiel Combat Ready In-Country Study in 1978. Later, in December 1979, the Commander in Chief, U.S. Army Europe, recognized a critical need to preposition Aviation assets in unit sets in Europe, to support deploying forces, and he suggested methods of storing such Aviation assets.

This high-level recognition of the need for a new FMC aircraft storage technique was followed quickly with the Defense Guidance for fiscal year 1982 through 1986 requiring the Army to seek ways to minimize strategic airlift support needed to rapidly reinforce NATO. These actions resulted in the Joint Aviation Storage Concept Validation Program and the development of the new long-term aircraft storage procedure.

Objectives

The overall purpose of the Joint Aviation Storage Validation Program was to confirm the findings of

Cobras in long-term, fully mission capable storage.

numerous other long-term humidity controlled storage tests, all of which clearly maintained "...that storage of aircraft for a 6-month period (and probably much longer) does not constitute a technical problem." The specific objectives of this validation program were as follows:

- To demonstrate the feasibility of pre-positioning AH-1S Modernized Cobra (MC) helicopters combat-ready in Europe.
- To define the specific preservation, maintenance and depreservation necessary to maintain FMC aircraft combat ready while in prepositioned storage.
- To determine the support assets (personnel, monies, materiel, repair parts and facilities) needed to store a base-line combat-ready Aviation unit (one attack helicopter company) on a long-term basis.
- To examine potential aircraft storage sites in Europe.

Scope

The Joint Aviation Storage Validation Program plan called for the placement of 14 AH-1S (MC) FMC helicopters in dehumidified storage in Herongen, Germany for 1 year. TSARCOM provided the 14 aircraft; a project officer (myself), in Germany; and quality assurance, maintenance, engineering and administrative support to the validation project. USAREUR provided the storage shelter in Herongen and a project point of contact, Mr. Earl Erickson, the POMCUS team chief from USAREUR headquarters, Office of the Deputy Chief of Staff for Logistics, War Reserves/Storage Division. The validation program was divided into these four major phases:

- Initial storage and preservation.
- The 6-month depreservation and evaluation.
- The 12-month depreservation and evaluation.
- The 6-months' follow-up evaluation.

Preservation and Depreservation

The preservation method applied to the 14 helicopters used in the science project was held to a minimum in keeping with the primary objective to avoid the need for extensive depreservation to return stored aircraft to an FMC status. As a result, the installation of charged batteries is all that is required when aircraft are removed from storage. The following minimum preservation steps were taken in Germany during the January 1982 validation project; the same techniques are available for future aircraft pre-positioning:

- The 14 aircraft were cleaned and were determined to be FMC.
- The aircraft were lubricated in accordance with (IAW) the 50-hour lubrication requirements using wide temperature range grease, national stock number (NSN) 9150-00-944-8953.
- Exposed portions of each helicopter's hydraulic system were coated with hydraulic fluid, fire resistant, NSN 9150-00-149-7431.
- Aircraft fuel controls were filled with 10-weight oil, lube oil aircraft engine petroleum, NSN 9150-00-273-2388.
- The helicopters were topped off with JP-4 fuel (this was the only type of fuel available for the project). Future storage programs will use JP-5 or JP-8, or, as an alternate, JP-4. JP-5 and JP-8 fuels are less hazardous and are more stable than JP-4.
- Batteries were removed and placed in adjacent storage IAW the procedures in TMs 11-6140-203-14-1 and -2 under a diode protected 28-volt 2-ampere trickle charge.
- Each helicopter was electrically grounded.

Six unit-level maintenance manhours were expended during the validation project to preserve each helicopter. Depreservation required a 10-minute operation which consisted of reinstalling a charged battery. The major challenge for any aircraft storage project is to ensure that each aircraft is in good condition and fully mission capable *prior* to preservation.

Validation Project Procedures

The Joint TSARCOM/USAREUR Aviation Storage Validation Program erased all doubts that long-term FMC helicopter storage would present technical problems. The validation project team placed 14 AH-1S (MC) helicopters in long-term storage in Germany in January 1982. These aircraft were meticulously checked to ensure that they were FMC. The aircraft were placed in dehumidified (less than 50 percent relative humidity) warehouse storage with minimum preservation.

After 6 months' storage, with no maintenance being performed on the aircraft while in storage, seven of the helicopters were removed from the warehouse and underwent extensive testing to identify storage-related problems to confirm mission capabilities. The evaluation process used on each of the first seven aircraft included the following:

- Safety of flight technical inspections.
- Careful preflight and daily inspections.
- Maintenance operational check (MOC).
- Visual technical inspection and preflight after MOC.
- Limited test flight.
- Careful preflight and ferry flight from Herongen to Ansbach.
- One hundred percent technical inspections.

• Armanent systems checks and boresighting.

• Careful daily inspection, preflight inspection and ferry flight from Ansbach, Germany, to the Wildflecken Range.

• Careful daily inspection, preflight and firing of each aircraft at Wildflecken Range.

• Careful daily inspection, preflight and ferry flight from Wildflecken Range to Hanau, Germany.

• Meticulous acceptance inspections by the 503d Aviation Battalion (Combat).

The last seven validation aircraft remained in uninterrupted storage for 8 more months until they were removed in March 1983. Then they underwent the same extensive inspections and testing that the first group of aircraft had been subjected to in July and August 1982. These remaining seven aircraft were issued to the 3d Aviation Battalion (Combat) after the inspections and testing.

6- and 13-Month Evaluations

The 6- and 13-month evaluations confirmed that the highly complex AH-1S (MC) helicopter could be pre-positioned for up to 14 months and probably much longer (estimated to be up to 4 years) and remain FMC with minimal preservation in a controlled humidity warehouse (40 percent to 50 percent relative humidity). The evaluations verified that preservation and depreservation of the Army's most complex helicopters involve simple unit-level maintenance tasks. These tests confirmed that no depreservation steps are required when using this new storage technique other than reinstallation of charged batteries.

The two evaluations also verified that aircraft fuel will remain stable and free of contamination during this type of storage. No maintenance problems related to storage were experienced, and very few maintenance problems of any type were encountered during the validation project.

Strategic Pre-Positioning Cost Estimate

A major part of the joint validation program included the development of a cost estimate to place one complete attack helicopter company in long-term strategic pre-positioned storage within Germany. The approximate stock funded cost in 1983 dollars for placing one attack company in pre-positioned storage (POMCUS) and of developing an aircraft storage preparation maintenance facility (SPMF) capable of supporting about two Aviation battalions (270 helicopters) is as follows:

Preparing a Cobra to be removed from fully mission capable long-term storage.

PRE-POSITIONING

- New site is $19,212,075 or
- Collocated with an existing POMCUS site is $11,212,000.

The cost estimate above includes an SPMF capable of supporting the equipment of two combat Aviation battalions in pre-positioned strategic storage and one controlled humidity 40,000-square-foot warehouse capable of storing the helicopters of one attack company. To store one battalion, a storage facility would need about three of these warehouses for aircraft storage and one and one-half warehouses for related materiel storage. Using the attack company as a baseline, the figure below shows the estimates.

A much more detailed explanation of the cost estimates is available in the Department of the Army, Office of the Deputy Chief of Staff for Logistics Joint Aviation In Storage Concept Validation Program Final Report, dated July 1983. A copy of this report can be obtained by writing to: Commander, TSARCOM (now TROSCOM), Directorate for Plans and Systems Analysis DRSTS-BAR, Attention: Mr. Valentin Berger, 4300 Goodfellow Boulevard, St. Louis, MO 63120. It should be noted that these are strategic pre-positioning cost estimates only (tactical storage would be much less expensive).

Technical Data

The large quantity of technical data collected by the aviation validation team is scientific proof that aircraft strategic and tactical pre-positioning is technically simple. This technical data is now part of an official record in TSARCOM, USAREUR, and Headquarters, Department of the Army, DCSLOG.

Humidity Control

The validation project proved that humidity control was the key to a successful long-term storage program. Although other past tests and this project support the premise that aircraft can be stored FMC successfully for up to 1 year under dry, free ventilation and minimum preservation circumstances, humidity control is undisputably the secret to true long-term FMC aircraft storage of more than 1 year. Humidity control of 40 to 50 percent relative humidity inhibits corrosion, stabilizes fuel, and prevents the drying of elastic seals and hoses. Temperature has little effect on aircraft storage except for the expansion and contraction of fuel in the aircraft. The validation project confirmed that temperature control is not needed nor desirable during long-term FMC storage.

Fuel Stability

The 14 helicopters in the validation project were topped off with JP-4 fuel prior to storage. Fuel samples were collected each month and were carefully analyzed by the USAREUR Oil Analysis Lab. Fuel samples were put through a full range of testing including tests for volatility; freezing point; copper strip reactivity; existent gum; and presence of particulates of water, and of microbiological activity. A very small amount of water was found in the first month's fuel samples from nine aircraft, but after that *no* water was found in the fuel cells, and all fuel remained stable.

Humidity control within the 40 to 50 percent range prevents condensation of water in fuel tanks, and, without water, contamination and microbiological growth cannot occur. The filling of fuel tanks in turbine driven vehicles is the most effective preservation technique available; it enables the vehicles to remain FMC throughout the storage period. (The British Armed Forces use the same fully fueled procedure in their long-term helicopter storage program.)

The validation project also established that there is no need for fuel sampling in aircraft in controlled humidity storage after the second month. Initial sampling is necessary, however, to remove settled water, and the second sampling is needed to establish a "baseline" sample. Fuel sampling needs only to be done semiannually thereafter.

Nickel Cadmium Batteries

All batteries must be removed from helicopters placed in pre-positioned storage. The 120-day service must be performed on the batteries, and the batteries may then be placed in adjacent storage IAW TMs 11-6140-203-14-1 and -2 under a diode-protected 28-volt/2-ampere

Storage cost estimated for one attack company.

• One company at a new site	=	$ 19,212,000
• One company at an existing POMCUS site	=	$ 11,212,000
• Two companies at a new site	=	$ 25,048,000
• Two companies at an existing POMCUS site	=	$ 15,339,000
• Three companies at a new site	=	$ 30,834,000
• Three companies at an existing POMCUS site	=	$ 19,411,000
• Eighteen companies at a new site	=	$144,429,000
• Eighteen companies at an existing POMCUS site	=	$ 94,779,000

trickle charge. The trickle charge (although not currently listed in TM-6140-203-14-1 and -2) will increase readiness by continuously charging each battery until it is replaced in a helicopter.

Range Firing

The first seven AH-1 Cobras were evaluated at Katterbach Army Airfield, Ansbach, Germany, after removal from storage. The 501st Aviation Battalion (Combat) sponsored the aircraft weapons evaluation at the range. During the 6 months' evaluation, 12,000 rounds of 20 mm ammunition, 616 2.75 inch rockets and 24 TOW (tube-launched, optically-tracked, wire-guided) missiles were fired with only one 20 mm gun malfunction caused by a loose electrical cannon plug. No maintenance problems related to storage were encountered. Seven hundred rounds of 20 mm ammunition and 187 2.75 inch rockets were fired by the 3d Aviation Battalion (Combat) during the 13 months' evaluation, with no malfunction attributable to storage.

Concept

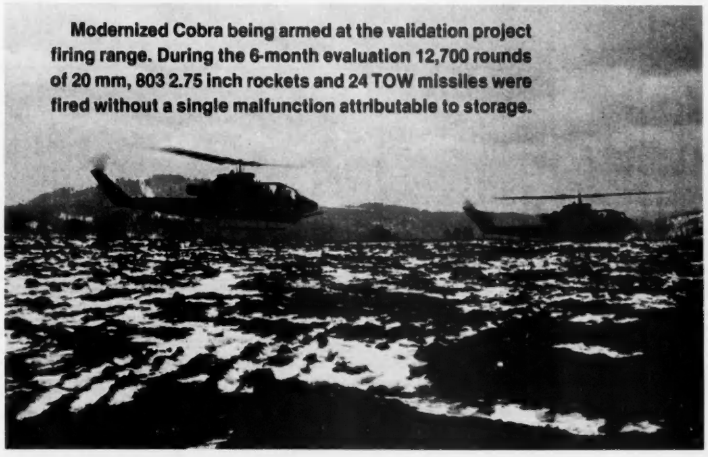
Under the new long-term aircraft storage technique, helicopters will be pre-positioned in complete or partial unit sets in an FMC status, and 12 months' storage with time extensions of 6 months will be used. Controlled 40 percent to 50 percent relative humidity conditions must be maintained within storage facilities. Controlled 40 percent to 50 percent relative humidity is preferred, but since European countries have naturally high humidity the year round, either "controlled humidity" or "dehumidified" storage will be successful. Storage facilities should preferably provide dark, unheated storage and must, as a minimum, protect aircraft from direct sunlight.

Helicopters destined for FMC storage will be prepared according to their condition and flying time since prior overhaul. Therefore, some aircraft will require a pre-induction program based on past Corpus Christi Army Depot projects like the "Blue Max Program" including spot painting and the application of corrosion preventive coatings. Other aircraft will require systems checks and repairs "as necessary," as well as spot painting and corrosion preventive applications. All helicopters will undergo the next scheduled maintenance phase inspection (including calendar inspections and aircraft condition evaluation) prior to storage. On the basis of performance of the above and a safety of flight inspection and test flight, if required, aircraft will be certified FMC at the SPMF and will be moved into a controlled humidity warehouse for long-term storage.

Helicopters will be stored fully fueled and with all mission equipment (armament, avionics, electrical countermeasure, etc.) installed. Weapon systems will be boresighted and determined FMC. Explosive safety devices will be installed on all stored aircraft. Aircraft will be stored with sufficient ground handling wheels to allow for maximum readiness and for rapid evacuation in the event of fire. The batteries will be kept nearby and will be trickle charged during the entire storage period. All confidential classified mission-essential equipment will be installed in each helicopter.

The SPMF, designed for strategic pre-positioning support, will be operated with a maintenance capability about equal to that of a fixed base nondivisional Aviation intermediate maintenance company. All unscheduled maintenance, special inspections or safety of flight modifications that come due during storage will be completed within the SPMF as soon as possible. The major objective of this type of storage is to keep helicopters FMC with sufficient acceptable "bank time" to ensure combat readiness.

The relative humidity control, sunlight protection, environmental stability, preservation and security provided for the FMC aircraft storage program will allow for numerous scheduled maintenance tasks (listed on the DA Form 2408-18) to be waived or extended while a helicopter is in storage, and/or to be extended after removal of the aircraft from storage. Facilities used to store FMC helicopters must provide humidity control or dehumidifying devices, resistant floors, explosion-proof wiring and



Modernized Cobra being armed at the validation project firing range. During the 6-month evaluation 12,700 rounds of 20 mm, 803 2.75 inch rockets and 24 TOW missiles were fired without a single malfunction attributable to storage.

lighting, and high-capacity vapor-evacuation capabilities.

Summary

The Army has found the answer to the following two particularly difficult questions:

- How will NATO be rapidly reinforced with Army aircraft without using U.S. Air Force strategic airlift capabilities needed for higher priority missions?
- What is a cost effective way of dealing with the frequent mismatches of maintenance, personnel and fuel assets with aircraft in Army Aviation units?

The answer to both of these significant problems is the use of the exciting new long-term FMC aircraft "strategic" and "tactical" storage technique developed during the 18-month validation program. The most complex helicopters may now be stored fully fueled, under minimum preservation and in a controlled humidity environment for up to 14 months and probably much longer without any significant deterioration.

Conclusions

On the basis of the experience of the Joint Aviation In Storage Concept Validation Program and numerous other past storage tests, it is concluded that:

- Helicopters can be stored using the minimum preservation technique for up to 1 year in a dry, free-ventilation storage area.
- The most complex helicopters may be stored fully fueled, under minimum preservation, and in a controlled humidity environment for 14 months and probably much longer (estimated to be 4 years) without any significant deterioration.
- JP-5 or JP-8, or, as an alternate, JP-4 is the best self-preservative for tactical or strategic long-term FMC controlled humidity storage. Fuel will remain free of moisture and stable "indefinitely" in this type of storage.
- Nicad batteries should be removed from stored helicopters and be stored nearby IAW TM 11-6140-203-14-1 and -2 under a diode-protected 28-volt/2-ampere trickle charge.
- FMC helicopter pre-positioned storage is currently the only feasible and cost effective way to reduce early U.S. Air Force airlift of Army aircraft needed to rapidly reinforce NATO.
- FMC helicopter storage is also a technique suitable for "tactical" use, to increase combat aviation readiness during peacetime, and to eliminate long-term disparities between the number of aircraft on hand and available crew, support personnel, repair parts and fuel.
- The main drive shaft and tail rotor drive shaft flexible coupling grease repack and inspection in all AH-1, UH-1 and OH-58 aircraft should be extended by at least 6 months.
- The storage technique demonstrated appropriate for the validation aircraft may be applicable to other types of complex military vehicles, systems and subsystems which must remain FMC during long periods of time (for example, the M-1 tank).
- The preparation, preservation, storage, maintenance and removal techniques developed during the joint validation program should be published in TM 38-450; the AH-1, UH-1 and OH-58 Unit and Intermediate Maintenance Manuals; and the Nickel Cadmium Battery Manuals as soon as possible.

Recommendations

On the basis of the experience and conclusions of this concept validation program, it is recommended that:

- The conclusions above be accepted as a basis for "strategic" pre-positioning of helicopters for deploying units, and for "tactical" storage of active unit Army helicopters, as requirements necessitate.
- Unit commanders consider the new storage technique as an at least partial answer to shortages of fuel, repair parts, support equipment, crew or maintenance personnel they may be facing.

ABOUT THE AUTHOR

Major Dandridge is a graduate of the Armed Forces Staff College in Norfolk, VA. He is a Senior Army Aviator, a maintenance test pilot, an instructor pilot, an instrument flight examiner and an aircraft maintenance officer. A graduate of the U.S. Army Transportation Advanced Course, he holds a B.S. degree in aeronautical science from Embry Riddle Aeronautical University and an M.S. degree from Florida Institute of Technology. Major Dandridge was the Joint USATSARCOM/USAREUR Aviation In Storage Concept Validation Program team chief and the assistant AH-1S Modernized Cobra fielding team chief from November 1981 through June 1983. He is now a member of the Logistics Coordination Cell, Host Country Support Team, J4/7, U.S. European Command.

Captain (P) Charles W. Henry

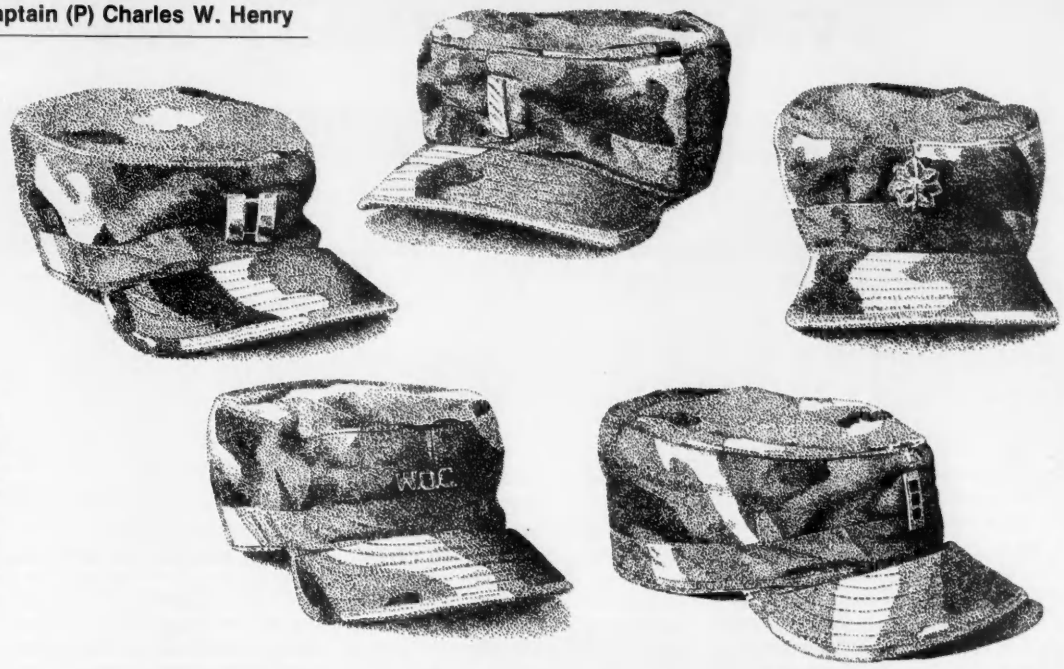


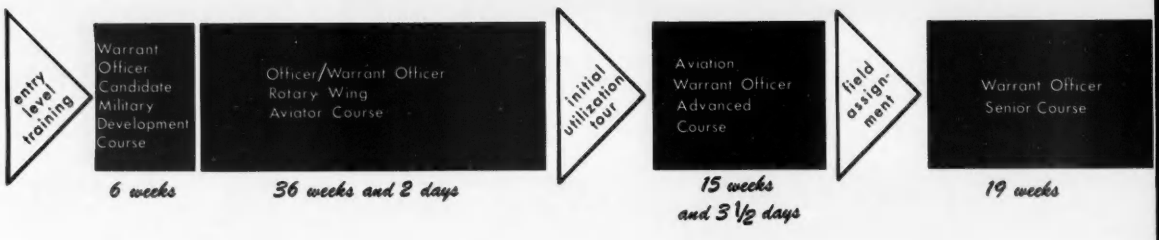
illustration by Paul Fretts

Training the Aviation Warrant and Commissioned Officers

PERHAPS THE MOST significant development in Army Aviation in recent times was the designation of Army Aviation as a branch and the centralization of Aviation proponency at the U.S. Army Aviation Center. Inherent in the decision to take these actions was the realization that the decision would have a marked impact on individuals, the Aviation Center and the Army as a whole. With the award of branch status to Aviation, the Aviation Center accepted the responsibility to design, implement and sustain those courses necessary to fully develop the Aviation officer, both commissioned and warrant, in the tactical, technical and managerial skills required to successfully lead, train and employ Aviation units on the AirLand Battlefield.

To accomplish this mission, the Aviation Center has developed a comprehensive training plan for both Aviation commissioned officers (ACO) and Aviation warrant officers (AWO). This article provides an overview of the training plan for these officers. It also initiates a series of articles, continuing through the July issue, addressing each course in detail.

AVIATION WARRANT OFFICER

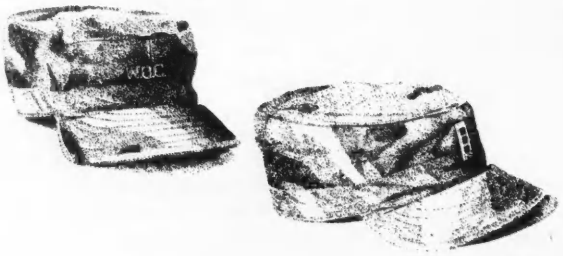

entry level training
Warrant Officer Candidate Military Development Course
6 weeks
Officer/Warrant Officer Rotary Wing Aviator Course
36 weeks and 2 days
Initial utilization tour
Aviation Warrant Officer Advanced Course
15 weeks and 3 1/2 days
field assignment
Warrant Officer Senior Course
19 weeks

Aviation warrant officers are the technical experts in the field of Army Aviation. They fill the majority of cockpit seats in Aviation units. Their technical expertise complements the ACOs' tactical expertise and allows Aviation units to function effectively. AWOs must be able not only to fly aircraft but also to:

- Plan, organize and lead missions.
- Execute proper tactical doctrine.
- Perform administrative functions.
- Supervise the technical aspects of Aviation standardization, maintenance and safety.
- Provide leadership.

The Warrant Officer Candidate Military Development Course

The first step in the professional development of AWOs is their successful completion of the 6-week-long Warrant Officer Candidate Military Development Course (WOCMDC). The WOCMDC is a rigorous course that stresses basic military skills and professional development. The warrant officer candidates (WOCs) are continually evaluated by their peers; their instructors; their training, advising and counseling officer; and their company chain of command. Weak or unmotivated WOCs are usually eliminated well in advance of attending the Officer/Warrant Officer Rotary Wing Aviator Course.



The Officer/ Warrant Officer Rotary Wing Aviator Course

WOCs are not considered "specialty qualified" until they have successfully completed both the WOCMDC and flight training. WOCs and their commissioned officer counterparts receive the same flight training. There are minor variations in the academic training presented. This is due to differences in the career development of each group. Additionally, WOCs continue to receive professional development training under the WOC company cadre. The WOCs are appointed as warrant officers the day prior to graduation from the flight training. Upon graduation from the flight training, the newly appointed WO1s will normally depart the Aviation Center for initial Aviation utilization tours. Selected individuals may remain at the Aviation Center for transitions into other aircraft prior to going to their initial utilization tours. Flight training is further discussed on page 12.

field assignment

■ *Courses taught at the U.S. Army Aviation Center.*

Specialty courses such as the Instructor Pilot Courses, Aviation Maintenance Officer Courses and Aviation Safety Courses may occur at various points in the Aviation warrant officer's career and are not discussed in this article.

The Aviation Warrant Officer Advanced Course

AWOs can reasonably expect to return to the Aviation Center sometime between their third and ninth years of warrant officer service to attend the Aviation Warrant Officer Advanced Course (AWOAC). The AWOAC is a 15-week and 3½-day course which prepares AWOs for assignment to positions of higher responsibility. The course provides training in three major areas:

- The role of Army Aviation as it relates to the missions and functions of the Army.
- Aviation staff functions and procedures.
- Combined arms operations.

The Warrant Officer Senior Course

The Warrant Officer Senior Course (WOSC) is the capstone course for warrant officer professional development. It is a 19-week, branch immaterial course for warrant officers in grades CW3 and CW4. The course provides its students with an understanding of the organization and functions of the major Army commands, joint commands and combined commands. It also broadens the intellectual depth and managerial abilities of students in preparation for their assignments to high level warrant officer positions coded 4A. Selection for the resident WOSC is highly competitive; only about 10 percent of those warrant officers eligible for the course are selected to attend.

Nonresident Courses

Nonresident versions of several of the aforementioned courses are either already available or are being developed. These nonresident courses are primarily designed to support Reserve Component training, but they are available for enrollment by Active AWOs as well. Enrollment in the nonresident versions may be particularly valuable for those officers who:

- Desire to complete the course early.
- Were not selected for the resident course.
- Desire additional training in the specific subject matter covered.

A listing of the nonresident courses available, prerequisites for each and enrollment procedures can be found in DA Pam 351-20, "Correspondence Course Catalog."

ABOUT THE AUTHOR

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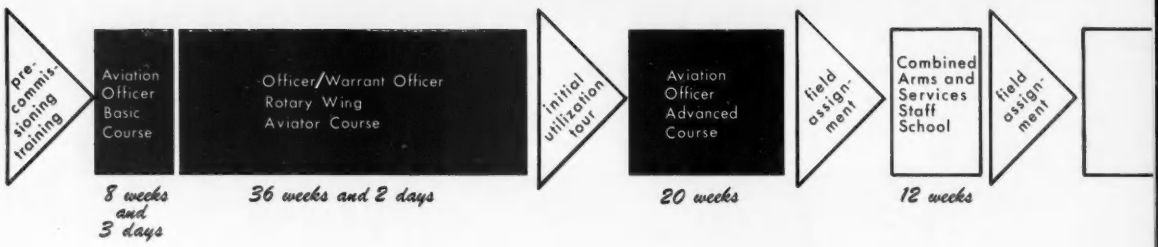
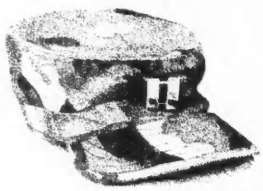
Aviation Commissioned Officer



The role of Army Aviation is to conduct/support prompt and sustained combat operations on land. For Army Aviation to fulfill this role, ACOs must be expert in the doctrine, organization, equipment and tactical employment of Aviation. They must be trained in those skills necessary to command, direct and control Aviation units in conjunction with land forces as a full member of the combined arms team. The ACOs must be able to:

- Fly aircraft.
- Plan, organize and lead Aviation units in accomplishing missions.
- Execute proper tactical doctrine.
- Perform administrative functions.
- Supervise aircraft maintenance.
- Provide leadership.



The Aviation Officer Basic Course

The Aviation Officer Basic Course (AVNOBC), sometimes referred to as Lieutenants' Training, is the cornerstone on which the ACO training plan is laid. The AVNOBC provides newly commissioned lieutenants with a general knowledge of common military and combined arms training prior to their attending flight training. The course emphasizes the fundamentals of leadership, weapons qualification, training management and safety; the goal being the development of professional Aviation platoon leaders. The course is 8 weeks and 3 days in length and includes a 5-day field training exercise. This course is scheduled for implementation in July 1984.

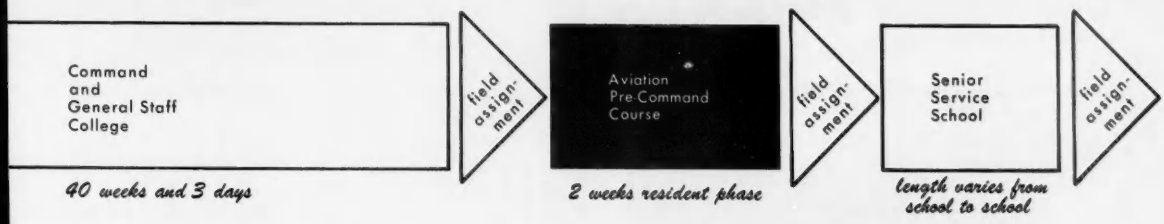
To effectively perform their duties, Aviation lieutenants must be rated Army aviators. Therefore, they cannot be considered "branch qualified" until they have successfully completed both the AVNOBC and flight training. The two courses form a continuum of training with the AVNOBC graduates moving directly into the flight training course.

The Officer/ Warrant Officer Rotary Wing Aviator Course

Flight training lasts 36 weeks and 2 days. It takes student aviators from initial flight training in the TH-55 helicopter through combat skills and night vision goggles qualification in the UH-1H Huey or OH-58 Kiowa helicopters. The course also provides 2 weeks of professional development training just prior to graduation to ensure that students arrive at their initial unit of assignment with the skill not only to fly, but also to perform those additional duties which may be assigned to them. As mentioned previously, the Aviation lieutenants will be considered branch qualified only after successfully graduating from both AVNOBC and flight training.

Aviation lieutenants can normally expect to depart the Aviation Center for an initial Aviation utilization tour immediately following graduation from flight training. Selected individuals may, however, remain at the Aviation Center for transitions into other aircraft prior to going to their initial utilization tours.

Training


Command and General Staff College
field assignment
Aviation Pre-Command Course
field assignment
Senior Service School
field assignment
40 weeks and 3 days
2 weeks resident phase
length varies from school to school
Courses taught at the U.S. Army Aviation Center.

The Aviation Officer Advanced Course

The next step in the professional development training of ACOs occurs somewhere between their third and seventh years of commissioned service. At this point, ACOs return to the Aviation Center to attend the Aviation Officer Advanced Course, sometimes referred to as Captains' Training. The advanced course prepares ACOs for command at the company/troop level and for staff assignments at the Aviation battalion and brigade/group level. The course is 20 weeks in length. The Aviation Officer Advanced Course will be implemented in June 1984.

From this point, ACOs become eligible for those professional development courses presented at other locations. ACOs may reasonably expect to attend the Combined Arms and Services Staff School, the Command and General Staff College and senior service schools such as the Army War College at appropriate points in their careers.

The Aviation Pre-Command Course

ACOs selected for Aviation unit commands at the lieutenant colonel/colonel level will attend the Aviation Pre-Command Course (PCC). The PCC is presented in four phases. Phase 1 is a self-study packet with diagnostic examination. Phase 2 is a 2-week resident academic portion conducted at the Aviation Center. It provides the "Aviation flavoring" to the PCC by updating and refreshing the Aviation command designees on issues related to command of Aviation battalion and brigade size organizations. Phases 3 and 4 (command development and how to fight) are presented at the U.S. Army Command and General Staff College, Ft. Leavenworth, KS.

The Aviation PCC is the capstone course in the development of ACOs in their Aviation specialty.

Nonresident Courses

As is discussed for warrant officers (page 11), nonresident courses are available to Active duty officers and Reserve officers. See DA Pam 351-20, "Correspondence Course Catalog."

This article has provided an overview of the training plan for Aviation officers, both commissioned and warrant. It has traced the training of the Aviation commissioned officer from officer basic course through eligibility for senior service schools and the training of the aviation warrant officer from the Warrant Officer Candidate Course through the Warrant Officer Senior Course. Follow-on articles in this series will address the Aviation Center courses described herein in detail.

Coming next month:
A detailed look at the Aviation Officer Basic Course and the Warrant Officer Candidate Military Development Course.

PEARL'S

Personal Equipment And Rescue/survival Lowdown

Jean Moffitt photo by CW2 Scott Busby

Do it Yourself Personal Survival Kits

You wouldn't forget to put your flightsuit on in the morning before climbing aboard your flying machine, would you? Of course not! Well, the same principle should apply to packing a personal survival kit in that flightsuit.

"But my aircraft has a survival kit packed in the back (or on top of the wing) of the plane. No need to take up valuable flightsuit space with something I'll never use." Wait a minute. You just said the key words, to wit, "...in the back of the aircraft."

And if you think your chances of living through an aircraft forced landing are slim and none, you'd better think again. C-130s, for instance, have been successfully ditched and force landed. The accidents were survivable, but the crews of these successful forced landings had only enough time to get out of the craft before it either burned or filled with water. The result: one crew minus their survival kit equals one very unprepared crew.

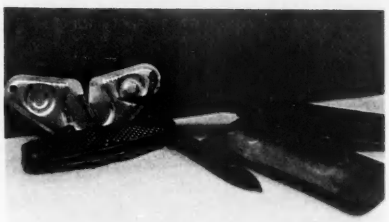
Believe it or not, a personal survival kit is a lot more than an extra pack of cigarettes and a candy bar stuffed in your pocket. Having the necessary equipment for an emergency situation increases your chances for survival immeasurably. However, being prepared doesn't mean carrying a backpack to your aircraft and having another crewmember hold it for you. Being prepared does mean, on the other hand, packing a personal minimum survival kit in your flight suit.

Such a collection of items is aptly named. It's personal because only you decide what you will need, and only you put it together. It's minimum because only the bare essentials are included. Finally, it's a survival kit because it will enable you to survive and, due to its small size, can be packed easily in your flight suit. Come on now! With all those pockets, you've got to have room somewhere.

Before packing a kit, stop by your local life support shop, tell them you're making a personal minimum survival kit and see if they can provide you with any items for your kit. Each shop differs in what it can supply, but it's worth a try. Besides, the insight they can provide will prove helpful in any case.

The contents of a kit are determined by the type of terrain you're flying over and your own personal requirements, thus no two kits will be the same. Survival kits should, however, meet certain specific criteria. All items must be necessary, practical and, more importantly, compact. Com-

photos by Captain Byron L. Howard



A good knife is essential, but knowing how to sharpen it is just as important.

Shown here are possible items for your kit. Included are a "metal" match (basically flint and steel), and water purification tablets.

mercial survival kits containing everything but the kitchen sink (which can be purchased separately at extra cost), range in price from $5 to $80, yet are not as good as the one you design and construct for yourself. Your kit is designed by you, for you, and the locations you fly over most often. Too, most of the items in such a kit can normally be found around the home which greatly reduces the cost.

The simplest kit, and the easiest to carry, is the pocket survival kit. Here's what you'll need to put together such a kit:

Penlight Flashlight—An inexpensive (less than $2) penlight barrel works quite well. Remove the batteries and spring.
Matches—Cut a plastic straw the same length as the flashlight barrel and seal one end by melting it, or filling it with wax from a candle. Break several wooden matches in half and place them inside the straw so their heads don't touch. Seal the other end of the straw. The straw itself can be used as tinder in starting a fire later on. You can also dip the matches in paraffin, further waterproofing them.
Needle—Magnetize a needle by rubbing it with a magnet. Hang it from a string and note which end points north. Paint that end. Drop it in the flashlight barrel.
Safety Pins—Drop two small safety pins inside the barrel.
Knife—You may have a small knife that will fit inside the barrel of the flashlight. If you don't we recommend a single-edge razor blade. It's best if the blade has a hole in it. That way, the safety pins can be used as a handle.
Birthday Candle—Get the "trick" kind if possible. If the wind blows it out, it will relight itself.
Wire—Squeeze some very thin, pliable wire for snares next to the candle and matches.
Foil—Fold and tuck a piece of aluminum foil around the candle, matches and wire. Foil can be used as a reflector or a signal mirror. In the remaining space, try stuffing other items such as tincture of iodine or globaline tablets for purifying water.

Larger kits can be constructed by using plastic cigarette cases, soap dishes or bandaid tin box. Remember, the number and type of items are determined by the designer, and that's you. Don't forget any medication you might need, such as antiallergy or hypertension drugs.

Some additional items you can place in a larger kit include:
Plastic—Handled carefully, it can be used as a shelter, raincoat or a sleeping bag when stuffed with leaves, pine needles and grass. It will hold in body heat and minimize the effects of wind. In desert areas, it can be used to construct a solar still. In order to make a piece of plastic compact enough to fit in a cigarette case, for instance, you'll have to prick it with a pin to release the trapped air. This won't affect the waterproof quality of the plastic.
Matches—Matches are laid with heads alternating, with the second row placed 90° to the first row. Melt wax over the entire stack. The wax makes the matches waterproof and buoyant.
Safety Pins—Our old friends. Pack various sizes.
Fish Hooks—Sizes 10, 12 and 16, plus 20- to 25-feet of 10-pound test line.
Knife—A multiple-bladed small knife. Be sure to sharpen and oil it prior to packing. If you carry a survival type knife in your flightsuit-knife pocket, be sure to secure it with some nylon cord.
Button Compass—Available at toy or sporting goods stores for less than a dollar. The old adage, "You get what you pay for," holds true in this case. Don't spend a fortune, but do buy a good compass. It can be most valuable.
Balloon or Prophylactic—Use as a water container.
Bouillon Cubes—One or two can provide a warm drink that really boosts morale.
Salt—Place in a sealed straw.
Metal Lid—If you use a metal container, polish the lid for use as a signal mirror. Punch a small hole in the center of the lid for sighting purposes, then seal it with tape or wax.

Remember, you're the user of the kit, and these are just suggestions. You can add or delete items as necessary.

This article was written by Staff Sergeant Gary J. Turner, 3636 CCTW, USAF Survival School, Fairchild AFB, WA, and is a reprint from the USAF publication, *The MAC Flyer.* This information not only applies to Air Force pilots, but ALL pilots in general, especially those pilots who routinely fly VIP missions. This could also be an addition to the survival vest, but *will not* be used in lieu of the survival vest.

If you have a question about personal equipment or rescue/survival gear, write PEARL, DARCOM, ATTN: DRCPO-ALSE, 4300 Goodfellow Blvd., St. Louis, MO 63120 or call AUTOVON 693-1218/9 or Commercial 314-263-1218/9.

the human factor in aviation mishaps

U.S. ARMY SAFETY CENTER

"TO HAVE AN ACCIDENT is unfortunate. To have an accident and learn nothing from it is unforgiveable," *Flight Safety Digest,* July 1983.

Learning from accidents is the major reason for conducting accident investigations. One of the hardest accident cause factors to learn from, unfortunately, is human error. The number of variables in human behavior, individual reaction to stress and personal ego make identification of the human element in aviation mishaps and development of ways to prevent them from happening again extremely difficult.

Human errors account for as much as 50 percent of the aviation mishaps in a "good" month and up to 85 percent or more at other times—a fact of serious concern to safety professionals and commanders at all levels. The incidence of human error, either alone or in combination with other cause factors, remains dismayingly constant in aviation mishaps during peacetime operations as well as during combat.

Why do human errors persistently cause or contribute to so many aviation mishaps despite continual improvements in the machines? The technological sophistication of modern aircraft in itself increases the opportunity for human error. As technology improves, demands on the pilot increase. Causation becomes a matter of probability and time—if the equipment does not break, there is more time and more opportunity for human error to occur.

The pilot whose ability to think, make decisions and execute actions make him the strongest element in flying operations can also be the weakest link in the accident prevention chain. Machines are not subject to emotions, fatigue, mental stress or ego—people are. People have both psychological and physiological limits. When there is a system overload, the potential for human error increases sharply.

A pilot's brain, which functions somewhat like a computer, is constantly barraged by information from all five of his senses. The information has to be sorted, given priorities and acted upon. Given the complexities of flying under all kinds of conditions, it is small wonder that the system doesn't always function perfectly. For instance, an aviator may be concentrating so hard on a visual stimulus that a sound he needs to hear simply cannot break through. This overconcentration intensifies under stress and can even result in "who's flying the aircraft?" if all crewmembers are affected in the same way by the stimulus. Aircraft have drifted into trees or been flown into the ground before anyone realized what was happening. Having a crewmember read instruments aloud to the pilot who repeats what he is hearing may prevent them both from concentrating on the same visual stimulus to the exclusion of whatever else is happening. Some pilots even resort to talking aloud to themselves about the procedures they are executing—better to be thought a little mad than to fly an aircraft into a hillside.

Repetition or procedures accomplished by habit can be equally dangerous to aviators. A pilot who forces himself to consciously check each switch or light rather than glancing at them may prevent himself from overlooking something because he thought he saw something that he really didn't see at all. Overfamiliarity with a job can also lead to slackness in following procedures. Almost everyone remembers when he first learned to drive a car. Every sense was at high pitch and the slightest maneuver was carefully and meticulously executed. But most experienced drivers catch themselves occasionally driving by "remote control" until something unusual catches their attention and they realize that they have no real recollection of driving the past few miles. Aviators also have to guard against such lapses.

Long periods of time when there are no accidents, or near accidents, affect people in hazardous occupations. For a period of time following an accident, close attention is given to performing the kind of act involved in the accident but that is hard to maintain.

A report on human factors published in *Aviation Safety* in

January of 1984, cites a study by psychologist Gerjo Kok, at the State University of Groningen, The Netherlands. Following a fire in a chemical plant, two groups of people were asked whether they thought such a disaster could happen again within six months or in greater than six months. They were also asked how serious they thought another fire could be, how likely it was that a fire would occur and how concerned they were about it occurring.

Everyone agreed it could happen again (pilots agree that an accident can happen involving their aircraft). However, those who saw the event as being more distant in time also felt that an accident was less likely, would be less severe, and they were less concerned about it. Kok points out that "people tend to underestimate the disadvantages of long-term behavior. This underestimation is a result of an underestimation of the severity of a consequence: the further away, the less serious." According to this study, the aviator who believes that while an accident can happen, it will be in some far distant time is less likely to believe it will be serious and he will be less concerned about it. This can lead to the "it won't happen to me" kind of thinking that many aviators describe—until suddenly, the mishap occurs.

Aviators may feel that the charge of human error all too often places total responsibility for a mishap on aircrews. In some instances, however, although the mishap was the direct result of an error made by the pilot or copilot, the chain of human error began before the aircraft ever left the ground. It may have begun with maintenance or operations personnel or even further back with the attitude and type of leadership of a unit commander. Any or all of these may contribute to the aircraft mishap. That was the case in the following accident.

A pilot and copilot who were scheduled to fly a support mission for a field training exercise completed the preflight of their AH-1G and went to operations for a mission briefing before their 0830 scheduled takeoff. (The pilot had learned about the mission assignment at 1830 the day before but was unable to obtain a briefing because the operations officer was tied up in a unit staff meeting that promised to be a long one.) Before leaving the aircraft, the pilot instructed the crewchief to close and secure the inspection panels and cowlings. As the crewchief was about to secure the last of the cowlings, the platoon sergeant asked him to get an auxiliary power unit and start another aircraft as soon as possible. He left, thinking he would have time to return and finish the job before takeoff.

When the pilot and copilot entered flight operations, the operations officer, who was talking on the phone, told them he had incorrectly posted their takeoff time—they were supposed to have taken off at 0730. The CO, who was on the phone, was "having a fit" because the battalion had been "bad-mouthed" by the high-level ground commander whose FTX was being held up.

The pilot and copilot responded to the urgency in the operations officer's manner by running back to the flight line to get the aircraft airborne as quickly as possible. When they arrived, the pilot handed the mission sheet to the copilot and said he would crank the aircraft while the copilot plotted

coordinates and planned navigation. The copilot, intent on the mission which lay ahead, gave his side of the aircraft a quick look as he climbed in. He either did not see the open latches on the transmission and engine cowling or they did not register on his mind. The pilot saw that the rotor was clear and untied, glanced down his side of the aircraft, and thinking everything was okay, got into the cockpit.

The pilot began starting procedures without a fire guard because no one was immediately available and time was essential. They hurried through the runup and were cleared into position for immediate departure. On climbout, at about 150 feet and 40 knots, the left-side engine cowling opened, broke loose and struck the tail boom, vertical fin and tail rotor, causing separation of the 90-degree gearbox. The pilots heard the noise and felt a shudder as the aircraft yawed to the right. The pilot immediately entered autorotation and elected

to land on the remaining runway. At about 20 feet, he increased collective to check the rate of descent and simultaneously reduced throttle to establish alignment for touchdown; but these coordinated throttle and collective actions failed to align the aircraft with the path of flight. The aircraft touched down in a level attitude at 5 to 8 knots of ground speed with a 60-degree right yaw. After touchdown, the left skid dug in, the cross tube collapsed and the aircraft rolled on its left side, sustaining major damage. The pilot closed the fuel and electrical switches and both pilots, who were uninjured, got out of the aircraft without assistance. There was no postcrash fire.

On the face of it, this accident was caused by pilot error, but there were several other human errors which contributed to the mishap. The operations section was undermanned; the assistant operations officer had also been assigned the duties of battalion instrument examiner. This impacted on the operations officer who personally scheduled and coordinated all missions in addition to his other duties—and he made an error when he posted the incorrect takeoff time. When he informed the pilot and copilot of the Cobra that their takeoff time should have been 0730, not 0830, his own sense of urgency transmitted itself to the aircrew who responded by making more errors. The crewchief had made an error when he left the aircraft before securing all of the cowlings, thinking he would come back before scheduled takeoff and finish the job.

A less obvious error was made by the unit commander when he assigned the assistant operations officer as battalion instrument examiner without personally monitoring the effect on other personnel. Investigation disclosed the fact that he considered reports of undermanning by staff officers as "empire building" or excuses to "cover up." His attitude contributed to the pressure on everyone in the unit to get the job done somehow.

This pilot's reactions once the emergency began were in accordance with the -10 instructions. The reaction to mission urgency was where most of the human errors occurred which caused, or contributed to, a heavily damaged aircraft.

Aviators are subjected to both internal and external pressures to perform. Pride in having "the right stuff" to handle any situation can affect even the best pilot's judgment. Chauvinism can also be a problem in cases where aircrews develop an excessive loyalty to a unit or a particular mission. It takes a great deal of personal discipline for an aviator to decide not to fly a mission because of his own physical and mental condition. A pilot who can rationally decide that factors such as weather preclude a safe flight will probably have much more difficulty admitting that he shouldn't fly because he simply isn't up to par. So even though he may be suffering from a dangerous combination of illness, fatigue and stress—he flies anyway.

Commanders or supervisors who project a "let's guts-it-out boys" image add to the pressure on aircrews to fly when good judgment says otherwise. *Supervisors who not only know their people well but who are attuned to signs that something isn't as it should be will make it easier for aviators to make reasonable decisions.* An "open door" policy is never more important than when it means the difference in someone attempting a mission when too many indicators say "no go."

The human factor in mishaps can never be completely eliminated but awareness of the problem; realizing that monotonous, repetitive tasks can lull you into a near-hypnotic state; knowing that pride or career consciousness can cause you to fly when you shouldn't; and understanding that it takes more guts to decide not to fly, or to turn the aircraft over to a copilot inflight, than to go ahead when conditions say no, can reduce human error related aviation mishaps.

If you find yourself in any of the examples of human factors which contribute to accidents: if you can't admit that your physical and mental condition aren't up to safe standards, or you are convinced you're so good you can overcome all circumstances with flying skill, consider that such thinking may not mean the possibility of a minor mishap at some far distant time. It could be on your next mission and it could be catastrophic. *You* are the human factor, it's up to you to prevent the mishap.

References

Callen, James R., CW3; Kennamore, John R., CW2; Ricketson, Darwin S.; "Pilot-Error Accidents Aren't All Pilot," *United States Army Aviation Digest,* Jan, Feb and Mar 1975.

Liang, Stephen, Major, MD, DFS, "The Weakest Link," *Flight Comment,* No. 4, 1983.

Walker, Frank, Captain, USAF, "Pilot Error, The Why Behind the Words," *Aerospace Safety,* Mar 1979.

WIND SENSE

RECENT FIELD surveys to Korea, Hawaii and in the continental United States, have indicated that a lack of "wind sense" exists. Wind sense is more than just the ability to read a weather report and remember that reported winds are 270 degrees at 06 knots. Wind sense is an awareness at all times, of wind direction, approximate speed, and how that wind will affect the flight or maneuver being performed.

Army aviators share the air with the world's best flyers. No, not other Army aviators or blue-suiters; the best flyers are birds. We often call them hazards, yet, birds have accumulated considerably more flying hours' experience than we have. Admittedly, no data is available on the number of midair collisions or takeoff and landing mishaps our feathered friends have experienced; however, it is safe to assume they have far fewer than we do. Part of the reason for this is birds have wind sense.

Direct observation of birds led early aircraft designers to successfully develop airfoils and designs that resulted in powered flight. It certainly should be noted that Orville and Wilbur Wright selected Kitty Hawk, NC, because of the favorable winds. They had observed that birds takeoff and land into the wind, so wind sense then dictates don't takeoff or land downwind. Birds normally don't violate this rule. Watch birds returning to nest prior to a thunderstorm. When they are flying with the wind they execute an overflight at the roost and do a "circle to land approach" into the wind. Ducks sometimes can be spooked to takeoff downwind. When this occurs, once airborne, they turn into the wind. Hunters, of course, prefer to catch them upwind. In this case, good wind sense, bad pilot technique.

How does this affect me?

The second an aircraft departs the ground, it becomes a free vehicle in a moving body. The aircraft reacts the same as a boat when freed from the dock. The effects of wind are constantly present while the aircraft remains airborne.

Fixed wing pilots usually understand the effects of wind a little better than helicopter pilots. It embarrasses them as they round out for a landing to have the centerline shift to the left or right before landing. The standard answer is the runway moved. Actually, they forgot their wind sense. Watch the look of horror if one of us should suggest that a fixed wing pilot make a downwind takeoff in a 15 or 20 knot wind on a 2,500 foot strip.

Helicopter pilots often underestimate the effects of wind on their operations because of the unique flight characteristics of the helicopter. After all, the helicopter appears to hover motionless over the ground regardless of wind. It is easy to develop a casual attitude toward winds as long as the pilot doesn't exceed the operator's manual limits. Allowing this casual attitude to develop is both foolish and dangerous. Mishaps have occurred that can be directly attributed to the effects of winds. Though not the sole factor in the rash of recent mishaps involving the OH-58 Kiowa loss of tail rotor effectiveness, wind is a major contributing factor. In many cases, it was the final link in the chain of events leading to the mishap.

As the pilot hovered over the edge of the pond, did

he notice the ripples on the pond were moving in the same direction he was? If he had, he might not have attempted the nap-of-the-earth deceleration. An example of wind sense. The pilot executing a slope landing suddenly discovers that a 5 degree slope sure takes a great deal of lateral cyclic. Had he observed leaves on the trees he would have seen the wind was a direct crosswind, and to maintain the stationary hover already required a substantial lateral cyclic input. Again, wind sense at work.

A pilot elects to do a deceleration moving off an extended ridge line to the valley floor. It seems an excessive amount of power is needed. Wind sense: Air, like water, increases in velocity as it moves down slope. Ask a canoeist what happens to a gentle river when suddenly the banks narrow then widen. This is like a venturi effect, the velocity increases. The same thing happens to wind as it narrows in a valley opening. The controller cleared the aircraft for takeoff and reported winds at 090 degrees at 10 knots. A pilot with wind sense knows that is only true at the spot where the measurement was made. As the flight progresses, the aviator observes smoke drift, ripples on ponds, leaves on trees, terrain formations, the crab of the aircraft and even the oldest aviators, birds. This wind sense is applied and at the field site where landing, a descent is made to land *into the wind.*

Those who fly in mountainous terrain are keenly aware of the capricious nature of wind. Chapter 4, FM 1-202, is a good primer for those who wish to bone up on wind sense. The effects described in this chapter take place even in nonmountainous terrain, though not as pronounced. The following is extracted as an example of how a pilot determines his winds:

"**Determination of En Route Winds.** Every effort should be made to determine the wind condition both before takeoff and while en route. Weather forecasters can provide general information, but accurate information for the specific area of concern is not available through this source. Where ground communications exist with units in the area of operations, contact should be made to ascertain the existing wind conditions. Aviators who have recently flown in the area can provide a valuable source of information concerning wind conditions. However, these sources of wind information are not always available. Therefore, you must learn to use certain visual cues when estimating wind direction and velocity. The cues are divided into two categories.

"*Ground Indicators.* When using ground indicators to determine the wind condition, remember that surface winds are being indicated for that specific location. The wind characteristics a short distance away may be different. The upwind part of a small body of water is indicated by a smoothness. It may be wavy or turbulent on the downwind side. Wind velocity is indicated by the turbulence of the water. A whitecap will occur on an unprotected body of water when the wind velocity reaches 20 miles per hour. Smoke provides the most accurate indication of wind direction. Wind velocity is indicated by the pattern the smoke forms on the ground. In light wind, smoke will rise vertically with little horizontal movement. In strong wind, the smoke will disperse horizontally with little vertical movement. A flag or any material that is free to blow in a breeze will indicate both wind direction and velocity. The angle a flag forms with the ground indicates wind velocity. The color of the leaves on deciduous trees provides an indication of wind direction. If the leaves appear light in color (silver), you are flying downwind. If you are flying into the wind, the leaves will appear darker in color. Wind blowing over tall grass growing in open fields appears like waves on an ocean. Wind direction is indicated by the movement of the swells. The more frequent the swells, the greater the wind velocity. Man-made indicators such as wind sock, tetrahedron or smoke grenades, provide the most accurate information concerning wind direction and velocity. A wind sock should be installed at landing zones where repeated operations are conducted.

"*Aircraft Indicators.* As you become more proficient in mountain flying, you will develop the ability to determine wind conditions by the feel of the helicopter and its apparent movement over the ground. Aircraft indicators that you can use to determine the wind direction and velocity are as follows. *Aircraft drifts from the desired ground track.* This condition indicates a crosswind condition. The amount and direction of the crab required to maintain the desired ground track gives an indication of wind direction and velocity. *The apparent ground speed appears to be either faster or slower than the indicated airspeed.* This condition indicates the aircraft is being flown parallel to the wind."

In an era of sophisticated black boxes and high-powered aircraft, it is often easy to overlook or ignore simple facts learned years ago by pilots flying simple machines. To do so invites unnecessary risk and in many cases, tragic loss. Let's take time to go back to the basics and use good common sense—"wind sense."

DES welcomes your inquiries and requests to focus attention on an area of major importance. Write to us at: Commander, U.S. Army Aviation Center, ATTN: ATZQ-ES, Ft. Rucker, AL 36362; or call us at AUTOVON 558-3504 or commercial 205-255-3504. After duty hours call Ft. Rucker Hot Line, AUTOVON 558-6487 or 205-255-6487 and leave a message

AVIATION PERSONNEL NOTES

NASA Nominees

In the August issue we mentioned that the National Aeronautics and Space Administration (NASA) was looking for a few good astronaut nominees. We found some for them!

The Army has nominated 29 officers, in grades captain through colonel, to NASA for possible selection as astronaut candidates. The 1983 NASA solicitation was the first since 1979; however, NASA indicates that future crew requirements for the Space Transportation System will necessitate new astronaut selection on an annual basis.

The Army nominees represent an impressive array of scholastic, military and scientific talent. Their academic disciplines include: aeronautical, aerospace, electrical, nuclear and transportation engineering; biology, microbiology and zoology; physics and biophysics; chemistry, biochemistry and physical chemistry. Eleven are physicians. Thirteen are graduates of the U.S. Military Academy. Five are graduates of the Naval Test Pilot School at Patuxent River, MD, a springboard for earlier astronauts (both of the current Army astronauts are Pax River graduates). Six are experienced combat pilots. Eleven have served as military aviators and seven currently hold Aviation specialty codes.

Impressive as the nominees' credentials are, there is no guarantee that any of them will be among the 12 new astronauts NASA selects in 1984. So far, NASA has received more than 3,500 applications for the dozen new openings. To *apply,* you need at least an undergraduate degree from an accredited college in engineering, mathematics, biological or physical science. If you're applying for a mission specialist position, you also need 3 years' experience in your qualifying discipline. If you're a pilot applicant, you must have at least 1,000 hours pilot in command time for high performance aircraft (minimum 3,000 pounds thrust). Combat and/or test pilot time helps for either position.

Superb physical condition is a must. Applicants must be able to pass a NASA Class I or Class II flight physical (for pilots and mission specialists respectively). NASA's flight physicals are similar to the Army's, but NASA allows no medical waivers for new astronauts.

In response to NASA's 1983 solicitation, 150 Army personnel applied to become astronaut nominees. Ninety-two met all of the prerequisites and were forwarded to a selection board which operated much like a promotion board. Based on a review of individual applications and supporting documents—to include medical and personnel records—the board selected 29 applicants as "best qualified" to represent the Army in the NASA selection process.

Applications came from Active Army members, Army National Guard members, Army Reservists, enlisted, warrant officers and commissioned officers. The 29 nominees include two reservists and one female.

Sixteen of the nominees hold doctorates; four hold multiple master's degrees or masters unrelated to their doctorate. In addition to West Point, schools represented include Harvard, George Washington University, the University of California, Georgia Institute of Technology, Princeton and Rensselaer Polytechnic Institute.

The Army nominees are:

MAJ James C. Adamson	MAJ Edward W. Mayer
CPT Merill S. Blackman	MAJ Barbara Nylund-Morgan
CPT Michael R.U. Clifford	MAJ William E. Pohlmann
MAJ Michael P. Hagan	COL Harry D. Silsby IV
MAJ Robert J. Kainz	CPT James W. Voorhees
LTC John O. Benson	MAJ George J. Nepereny
CPT Walter L. Bogart III	MAJ Randall G. Oliver

MAJ Tomas Coronado
MAJ George R. Holt
MAJ Charles W. Lange Jr.
MAJ Julio J. Bird
CPT (P) Wayne W. Boy
CPT Benjamin W. D'Ooge
MAJ Hardy M. Howell
LTC Frederick C. Lough Jr.
CPT Paul B. Rock
CPT (P) Ronald P. Turnicky
MAJ James S. Voss
CPT (P) David N. Nicholson
CPT (P) Stephen E. Piwinski
MAJ Linas A. Roe
MAJ (P) Thomas L. Vollrath

Engineering Test Pilots

The Army needs more warrant officer engineering test pilots. Our authorizations are holding steady and our inventory is running a bit low. As you read this it's too late to submit an application to the 1984 selection board (scheduled for 22 February), but it is not too late to start thinking about 1985.

Check out DA Circular 351-82-5. Look closely at the prerequisites. A bachelor's degree in an engineering discipline is *desirable but not required.* You must have completed college level algebra, calculus and physics with above average grades. Essentially, the selection board needs to see that you have a high probability of successfully completing the quantitatively-oriented, rigorous course of instruction at the Naval Test Pilot School.

If you feel you meet the basic prerequisites and would like to talk about the program, contact Major DeLoach, AUTOVON 221-8156.

The following Hotline numbers can be called on official business after duty hours. They will be updated and reprinted here periodically for your convenience. If your agency has a Hotline it would like included, please send it to: *Aviation Digest,* P.O. Drawer P, Ft. Rucker, AL 36362.

	AUTOVON	Commercial
Aviation **Ft. Rucker, AL**	558-6487	205-255-6487
Engineer **Ft. Belvoir, VA**	354-3646	703-664-3646
Field Artillery **Ft. Sill, OK—ARTEP**	639-2064	405-351-5004
Redleg	639-4020	405-351-4020
Infantry **Ft. Benning, GA—ARTEP**	835-4759	404-545-4759
Intelligence **Ft. Huachuca, AZ—Training**	879-3609	602-538-3609
Maintenance and Supply **Tobyhanna Army Depot, PA**	795-7900	717-894-7900
Missiles and Munitions **Redstone Arsenal, AL**	746-6627	205-876-6627
Ordnance (Help Line) **Aberdeen Proving Gnd, MD**	283-4357	301-278-4357
Quartermaster **Ft. Lee, VA**	687-3767	804-734-3767
Signal **Ft. Gordon, GA**	780-7777	404-791-7777
Transportation **Ft. Eustis, VA**	927-3571	804-878-3571
Turbine Engines **Corpus Christi Army Depot, TX**	861-2651	512-939-2651

1983 Army Aviation

Policy Committee Meeting

The 1983 Army Aviation Policy Committee Meeting is now history, but the impact of decisions made during the 14 through 16 November 1983 session will be felt for many years.

Major Bryan C. Fluke and Mr. James P. Wall
Directorate of Evaluation and Standardization
U.S. Army Aviation Center
Fort Rucker, AL

Major Army command (MACOM) Aviation officers from throughout the Army and representatives of various Department of the Army (DA) staff agencies came together to hear the keynote speech by LTG Carl E. Vuono, commanding general of the U.S. Army Combined Arms Center, Ft. Leavenworth, KS. LTG Vuono set the mood of the conference by stressing the importance of orienting Army Aviation standardization toward realistic combined arms combat training. His guidance, coupled with the realization that the new Aviation Branch is now a full partner in the combined arms team, influenced virtually all of the decisions made during the conference.

BG (P) Robert F. Molinelli, executive chairman of the U.S. Army Aviation Policy Committee, presided over the meeting.

Seventy separate issues, developed and presented by MACOM members, were evaluated and recommendations made for their resolution by the end of the 3-day meeting. Some of the most significant issues and committee recommendations are summarized below.

☐ Issue: Doctrine, training and standardization for OV-1 Mohawk and other Army airplanes are based on combat roles that were defined in the 1960s. Consideration must be given to revising various training programs based on airplanes that will be available through this century and their projected combat roles.

The committee recommended that a working group made up of representatives of MACOMs be formed to resolve airplane initial and refresher training, doctrine and standardization problems. The first meeting for the working group was 27 February to 2 March 1984.

☐ Issues: (1) Aircraft checklists are not updated in conjunction with operator's manuals; (2) Recent Aviation publications distributed to the field contain erroneous information; (3) Excessive number of changes to Aviation technical manuals; (4) Poorly aligned and inappropriate emergency procedures require excessive rote memory to perform "immediate" action procedures; (5) Performance planning cards (PPCs) are cumbersome and data used for completion of PPCs is difficult to use in flight.

The U.S. Army Aviation Systems Command (AVSCOM), St. Louis, MO, is now publishing and distributing corresponding operator's manual changes simultaneously.

An agreement has been reached between AVSCOM and the Aviation Center at Ft. Rucker, AL, whereby an annual user review of each operator's manual checklist will be held to develop a change to these publications. A maximum of one change per year will be published except for new aircraft, e.g., AH-64 Apache, UH-60 Black Hawk, OH-58D Kiowa and when a safety-of-flight change is required. There is also a provision now for final review of changes prior to publication to reduce the number of errors.

In 1983, the Directorate of Evaluation and Standardization at the Aviation Center began user reviews of operator's manuals and checklists to reduce the number of underlined emergency

procedures and to simplify normal procedures. To date, revisions have been drafted for UH-1 Huey, UH-60 and OH-58 manuals.

The process for completing PPCs will be simplified in revised aircrew training manuals. Additionally, selected tabular performance data charts will be appearing in checklists.

☐ Issue: Policies, training publications and regulations change frequently for numerous reasons. The changes often allow users a broad basis for interpretation, thus affecting standardization. Briefing guides, similar to that used by the Federal Aviation Administration, giving the rationale for changes are desirable.

The committee recommended that drafts of publications sent to users for coordination include rationale for the changes. All of the drafts dispatched from the Aviation Center since 1 January 1984 contain rationale as recommended.

☐ Issue: Aviation units do not have an adequate means to train their aviators to detect, identify, and avoid or destroy threat air defense weapons systems.

The committee recommended that Headquarters, DA, expedite procurement of training devices that simulate threat air defense weapons systems.

☐ Issue: MOPP (mission oriented protective posture) equipment is unsatisfactory for use by flight crews. The boots are too bulky to allow proper movement of pedals; rubber gloves prevent aviators from wearing Nomex flight gloves; and the protective mask canister and survival vest worn with the protective clothing restrict aft cyclic movements.

The U.S. Army Materiel Development and Readiness Command, Alexandria, VA, is developing appropriate protective equipment to be used by flight crews. The committee recommended that the Department of the Army place greater emphasis on expediting fielding of aircrew protective equipment.

☐ Issue: Pargraph 2-6c(1), TC 1-134, authorizes commanders to reduce flying hours for highly proficient aviators by 15 percent and apply that saved time to other training requirements. Due to the need for additional training hours for less proficient aviators, further adjustment is desirable.

The committee recommended that adjustment of 25 percent be authorized. This change has been implemented by message.

☐ Issue: There is a conflict between TC 1-134 and AR 95-1 regarding the amount of time an aviator may be extended after the end of his/her birthmonth to complete AAPART (annual aviator proficiency and readiness test) requirements.

The note in paragraph 28c, TC 1-134, was deleted by message. The 30 days extension authorized by paragraph 3-9b, AR 95-1, remains in effect.

☐ Issue: Touchdown emergency procedures training in single engine helicopters was, by far, the most controversial issue raised at the conference. Emotions run high any time the subject of eliminating touchdown maneuvers that Army aviators have known all their flying career is discussed. Justification for and against touchdown emergency procedure training boils down to one point—does the value gained from the touchdown training outweigh the cost resulting from aircraft damage.

Mishap data accumulated since AH-1 Cobra touchdown emergency procedures training was terminated in the spring of 1983 convinced the committee to recommend elimination of touchdown emergency procedures training in all helicopters (except hovering autorotation) except for qualification training at training bases and selected MACOM areas. The issues will be reevaluated in 1 year.

Touchdown emergency procedures training was terminated by Department of the Army messages in November and December 1983.

COL James W. Lloyd, director, Directorate of Evaluation and Standardization and executive secretary, U.S. Army Aviation Policy Committee, thanked everyone for the enthusiasm and professionalism they exhibited. In closing, BG (P) Molinelli thanked the MACOM's staff officers representing them and commanders for their professional participation.

MONTHLY WRITING AWARD

THREAT

Captain (P) James A. Herberg
Threat Branch
Directorate of Combat Developments
U.S. Army Aviation Center
Fort Rucker, AL

You Can Trust the Russians

The Tanks of Autumn
Budapest, Hungary

It is 4 November 1956. You wake up and feel a tremendous sense of exhilaration. The chains which have linked Hungary to the Soviet Union since the end of World War II are about to be broken. You can sense a great uplifting of spirits in the Hungarian people. Yes, you think to yourself this may be the beginning of a new era.

You raise the blinds and open the bedroom window. The early morning sun is just clearing the city skyline, burning away the heavy mist and allowing bright streamers of light to enter the room. The cool morning air has the taste of freedom in it. It has only been 13 days since your country revolted against the Soviet-imposed puppet regime which has governed Hungary since the end of World War II, but what a 13 days! Now you envision a united Hungarian people. Free speech, free assembly, the right to exercise rule by the popular majority—this is the stuff of democracy and you see it in your future.

Even the Soviet-trained and -equipped Hungarian Army is with the people. When the General Staff called upon the military to put down the revolt, the widespread response was a refusal to obey. In fact, many of the soldiers have joined the revolution, bringing their weapons and expertise with them.

In your mind, the revolution is blossoming like a giant white rose, growing from the initial bud into a spectacular mature flower. You can see its influence spreading throughout the country as its petals touch every city and small town within its reach. You feel that all free countries must see this as a blooming of new ideals and hopes in a country long subjugated by a ruthless alien power. Yes, you feel good on this 4 November 1956.

Now you move through your apartment to the kitchen. As you prepare breakfast, your thoughts are again wrapped up in the glittering future that you see before you. You step outside for the morning paper. It is then that you hear the rumble of the Soviet tanks as they begin their entrance into Budapest. As yet, you do not identify the sounds. Though they are familiar, it has been more than 10 years since you last heard the clanking sound of armor on the move. You will never forget it again.

It is over in less than 3 weeks. On 23 November 1956 the revolt has ended. Your white rose has turned to red.

Note: In December 1956, Major General "Wild Bill" Donovan stated, "that should the Soviet Union determine to crush the spirit of liberty (in Hungary)," it would be "without regard to world opinion."

August Dust
Prague, August 1968

You are awake when the Soviets cross the borders of Czechoslovakia, though you are unaware of the Soviet actions. It is Prague, 20 August 1968. You have been working long hours and are tired and worried. Your son is a student in college, a young radical, enamored with Alexander Dubceks' 8-month-old

regime and the liberalization policies he espouses. Although it is 2:00 a.m. Wednesday morning and your son has school today, he has not returned home. You know he is with other young, excited students, debating the new freedoms, the course that the novel Czechoslovakian government must take, and what its future relationship with Russia will be. You are not sure of the future, but you have a long memory and you remember Hungary in 1956.

Waiting in your quiet, still house, you hear a new sound—the buzz and whine of engines growing in strength, as if a large number of planes are flying into Prague. You move outside and, in the sky over where Prague's two airports (normally quiet at this time of night) are located, you can see the constant landings and takeoffs of countless aircraft. The chill that begins moving through your body is not due to the weather.

You cannot go back to sleep, but now your wife is awake and beside you. Together you sit, watching the early dawn, silently waiting and hoping. You see the columns of Soviet tanks as they pass through the city. You hear the tramping of soldiers' feet and the barking of shouted orders, and you see the dispersion of troops to key tactical locations. By dawn, the occupation is over, but the killing has only begun. Again, you do not know this yet.

In fact, you do not know that your son was one of two cut down by Soviet tank machinegun fire at 5:00 a.m. this morning. You will spend days searching for him, but it will not be until early December that you find out that he is dead and how it happened.

No, at this time, you are only confused, asking yourself how could this have happened so quickly. There was no warning. You listened to the news and there was not even a hint that an invasion was imminent. In fact, you can remember one American specialist on Communist affairs saying, "There is no such excuse in Prague (for invasion). If the Red Army attacks, the Kremlin will never live down the aggression. Communism will never recover as a world movement." You remember your son, brilliant in his eloquence and conclusions, saying "We know they—the Russians—won't attack. It would set the cold war back 10 years. The Soviet Union's image as a peacemaker would be destroyed. It would derail the track of Soviet-United States' talks on detente and alienate other East European Communist countries and Third World nations. They have no choice but to accept the inevitable." But now you see a different conclusion and the extinguishing of another bright flare of freedom.

Soviet T-62 tanks.

Wings of Death
Afghanistan, 1981

You are in a cave in a rocky, wooded hillside in Afghanistan. It is early morning and the cool spring air is damp in this cavity that your guerilla force is using as a base camp. As you throw off your sheepskin covers, you notice the fire is out and no one else is in the cave. You get up and move slowly to the mouth of the cave, stretching stiff and tired muscles as you attempt to infuse some new life into your weary body.

Pausing at the cave entrance, you think back on the past year and a half spent fighting the Soviets. Though you can see no end to your struggle, you still feel the fierce determination to continue fighting against the Soviet aggressors. Even as you think these thoughts, you can feel your frame begin to tense up and it is only through a conscious effort that your muscles start to relax.

Now, standing in the doorway of your craggy home, you see the frost melting on the ground, the clear blue sky overhead, your company basking in the warm, soft sunlight, and a guard standing next to a tall tree overlooking the valley below. Smiling, you think of them almost as children for they are able to relax on a day like this but you, as their leader, are concerned with their safety and future operations. Men, women and children alike—you know you must provide for all of them.

You have been using this area as a base camp for some time now. Soon, you must move, for the Soviets and the Soviet-backed Afghan forces are bound to discover this hideout. Too many forays have been

launched from this area, and they are sure to notice that ambush and raiding parties are often seen moving in this area.

Now you detect the faint beat of a helicopter rotor system, but sound travels a long way in the crisp, thin air and you cannot spot the aircraft. You notice with approval that all activity has ceased and personnel, even young children, are remaining motionless behind trees or large rocks. Standing in the shadow of the cave opening, you search the sky with your eyes and finally spot the helicopter, a black dot in the sky slowly growing larger as it approaches your position. You can see that it will be at least 1,000 feet above the ground as it flies over and you follow it with your eyes as it draws closer. As it passes, you see a flash of what appears to be white and yellow smoke. You initially think that the aircraft has a problem, maybe an engine failure, but he flies beyond the crest of the hill and is lost to sight.

Later that afternoon, you search but find no wreckage. You decide then that it is time to move and your band will leave in the morning to once again find another safe refuge, from which to fight the Soviets, before it is too late.

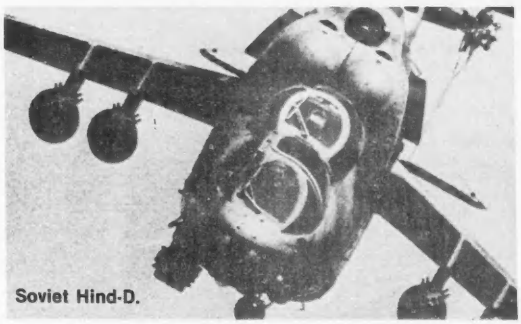
In the days to come, you will discover that it is already too late. Members of your guerilla force begin to slowly sicken and die. For the past 2 days, even you have been sick. Your band is now less than 50 percent effective and almost everyone is sick. Lying in your bedding, too weak to move about, you try to understand how everyone could be so sick. What kind of epidemic could have struck down your entire force?

But for you it is over. Your time for worrying and caring and fighting is done. When the survivors come to wake you in the morning, you will be dead. You will never know that the puff of white and yellow smoke that you saw coming from the Soviet helicopter was your last knell and that it was the cause of this carnage.

These three narratives, though fictional, are based on events that have actually happened. Though not specifically directed against Aviation, they are intended to bring out key lessons on Soviet philosophy which we must never forget:

- Never underestimate the threat forces. They are capable of conducting massive, unanticipated maneuvers in peacetime and war with little or no warning.
- Through judicious use of their transport equipment, both ground and air, they have the capability to bring overwhelming conventional force to bear on any single point in time as necessary.
- The Soviets will do what is required to preserve and/or consolidate their gain as necessary. They will act on perceived threats whether they are real or not.
- World opinion will have no influence on the conduct of their operations. If the Soviet perception is that they cannot be harmed or the damage to themselves will be negligible, they will do what they feel is needed to accomplish their objectives.
- The Soviets have the will to initiate and conduct operations to their conclusion. Once an action is started, they will generate the necessary support to see that it is successful.

Finally, it is not in words that we see the Soviet nature, but rather in their actions. As witnessed by their historical response to perceived threats and their current deeds, we can indeed trust the Russians. We can trust them to do whatever is needed to further their own interests no matter what the cost to others.



Soviet Hind-D.

Training the Army Aviator— Why Can't It Be Fun?

Captain (P) John R. Morrisette
Captain Morrisette was assigned to Lowe Division, Department of Flight Training, U.S. Army Aviation Center, when he wrote this article.

IN ADDITION TO the obvious flying skills required of today's Army aviator, a vast amount of general and technical knowledge must also be absorbed and retained. The complexity of today's aircraft, and the multitude of rules, regulations and procedures under which we fly, make the learning and retention of this data a seemingly overwhelming task and, at best, a drudgery of rote memory, memory aids and constant repetition. Since there will not be, and indeed cannot be, a relaxation of the Army's standards, perhaps the introduction of a spirit of competition and good, plain fun will make the learning experience more enjoyable. It is with this intent that the following game is described.

The "Aviation Training Game" can be considered a hybrid between a trivia contest and an old-fashioned Monopoly game. I first observed the game, or at least a variation of it, at the U.S. Army Field Artillery School where it was developed to assist in teaching battery commanders the basics of training management. It seemed to me at the time a good idea, and a useful training vehicle, and I present it for your consideration in the same spirit.

The game is basically played with a board, a series of question and answer cards of various difficulties and point values, one pair of dice, some pieces to use as markers and the contestants. The beauty of the game is its simplicity, limited only by the training level desired and the imagination of the instructor. It can be a fully illustrated board with plastic covered cards, or a simple piece of hand-drawn poster board and a few stacks of 3 x 5 cards. The pieces can range from Bill Cosby's "you be the bottle cap and I'll be the piece of glass" to lead miniature aircraft. Again, what you make of the game is largely up to the resources and imagination of the instructor.

So much for the formalities, now how do we learn and have fun at the same time?

First we design the board. The board itself is marked off in squares around its edges just like a Monopoly game, except that categories of knowledge are substituted for Board Walk, the Electric Company, etc. The categories chosen should reflect the knowledge required of the particular students undergoing training. Examples for initial entry rotary wing students might be emergency procedures, aerodynamics, limitations, rules and regulations, etc. If the game is to be used to refresh company aviators for the Annual Writ, categories can be added or deleted as necessary. Each category of questions should be assigned some point value (e.g., emergency procedures—10 points, limitations—5 points) and the appropriate squares around the boards should be labeled with a category, repeating categories as necessary. For a little added spice, throw in some "lose a turn," "refueling stop" or other squares. Of course there must be a moderator (instructor) with an answer sheet containing the references for each answer (the instructor still has to be prepared for his class), a stopwatch, and a pad and pencil for keeping score. Now we're ready to play. Simply throw the dice and start moving your piece around the board.

The players can be either individuals or teams. Flight platoons can compete against each other, or a few instructor pilots can get together and play to keep their skills sharp. The outcome can decide anything from who flies Saturday to who buys Friday night (hence the spirit of competition).

All we need now are a few simple ground rules. Reference materials can be supplied (e.g., approach plates, regulations, dash 10) or deleted as the situation warrants. A certain time limit can be given for each category of questions. If one team misses a question, they can receive zero points, lose points or the other team can have a chance at it. The game can be played to a certain score, a certain number of times around the board or a time limit. Suffice it to say that the game is extremely versatile and can be made easy or challenging (depending on the results desired and stage of training of the participants) and can run the gamut of a friendly game to an all-out competition. The important point to remember is that it's not only competitive and fun, it's a valuable instructional tool and a useful motivator. With today's complexity of aircraft and myriad regulations that must be learned and retained, the game stands on its own merits.

I've seen the game played and I've been a participant. It really works and I urge you to try your own variation in your own unit with a game designed for your aircraft and mission. I think you and your boss will both be pleasantly surprised. And the best part is that the aviators, and Army Aviation, benefit the most!

U.S. Army Communications Command
ATC ACTION LINE

Fly Neighborly

THOSE OF US who have been fortunate enough to throw off the chains of earthbound existence and wing our way across the land in helicopters are pioneers in the genesis of the greatest industrial expansion in the history of transportation. This privilege imposes special responsibilities. The slogan, "If they don't want to hear my helicopter, then they can listen to Russian tanks," exemplifies the negative attitude which in the past has responded to civil complaints of military helicopter operations. Resistance to helicopters is growing in metropolitan areas and is demonstrated in the variety of complaints and restrictive ordinances.

Dramatic increases in the number of rotary wing aircraft and corresponding public exposure has produced increased sensitivity and public awareness which is being influenced in a negative direction by bad press and the attitude expressed in the slogan above. The image exported by the entertainment industry in cinema like "Blue Thunder" (the "China Syndrome" of the helicopter industry) serves to further alienate a public whose perception of helicopters as conveyance of only the affluent, the corporate executive or military VIP is already negative. While our motivation for involvement may differ, the mandate of responsibility is obvious. Individually, we must: (a) convince the public that helicopters are not dedicated to pernicious intrusion into the solitudes of life, and (b) create a positive image of helicopters in every possible arena.

Can a slogan effectively promote such a positive attitude? The tone of an effort can certainly be set by the motto which represents it. When FAA published a Notice of Proposed Rule Making (NPRM) in 1981 legislating operational restrictions to reduce helicopter noise, industry response was immediate. The Helicopter Association International (HAI) emerged as leader of an extensive lobby effort which resulted in FAA withdrawing the NPRM in favor of industry self-regulation. The resulting HAI initiative borrowed "Fly Neighborly" from an early Bell Helicopter effort. It was selected as an umbrella slogan under which helicopter proponents will address noise abatement, public relations and community awareness.

The term *noise abatement* implies only one approach to helicopter sound control. Technology will gradually reduce sound exposure levels (SEL) of modern helicopters, but the stigma of present performance will remain unless other avenues of achieving compatibility are exploited. Fly Neighborly and Installation Compatible Use Zone are integral efforts which offer alternate approaches.

Public relations efforts emphasizing benefits and providing realistic descriptions of impact in areas of public concern must be pursued. By their involvement, communities become partners in continuing helicopter growth and adverse ordinances can be avoided.

Fly Neighborly is an upbeat, positive approach to meeting these public concerns. Education improves *community awareness*. Ambient SEL exceeding those of the largest helicopters are often acceptable to a listener who is educated to the benefit derived from that activity or because he anticipates participation. A well educated public may be Fly Neighborly's most important product.

The Aeronautical Services Office (DA point of contact for Fly Neighborly) is drafting guidance for inclusion in Change 2 to AR 95-1. It is insufficient, however, for DA to merely support Fly Neighborly. Commanders, operations officers and aviators must commit to aggressive involvement and avail themselves of every opportunity to sell the positive value of helicopter operations.

Mission planning in noise sensitive areas should be carefully evaluated to provoke use of the most compatible selections of route, altitude and operating technique. Obviously, mission and safety have priority but Fly Neighborly should be an inextricable element of both. In the vernacular, as industry is *into* furthering the growth and utility of the helicopter, so the Army must be *into* Fly Neighborly.

Readers are encouraged to address matters concerning air traffic control to:
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